

# Qwest Foundation for Education Competitive Sub-grant Application Assurance Sheet

Project Title: Teen Driving Safety Through Simulation Amount of Request: \$ 9709.64

District Name: Sugar-Salem Number: 322

Name of Certificated Teacher (or "lead teacher" if more than one): Fred Woolley



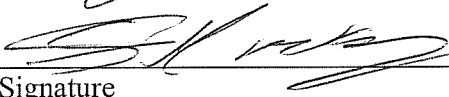
Name of School currently teaching at: Sugar-Salem HS

Years taught in Idaho K-12 public education: 2

Content area(s) that you are teaching in Idaho K-12 public education: Counselor K-12, Driver Education

I certify that if I receive a Qwest Foundation for Education Grant –

- I agree to create a video highlighting my project for the purposes of sharing best practices with other Idaho K-12 teachers.
- I agree to do one presentation on my project to other Idaho K-12 teachers before October 31, 2010.
- I agree to submit an electronic report to the Idaho State Department of Education before October 31, 2010.

Superintendent Name (print) <u>Alan Dunn</u>	E-mail <u>Adunn@sugarsalem.com</u>	Telephone <u>208 356 8802</u>
Signature 		
Principal Name (print) <u>Tared Jenks</u>	E-mail <u>Tjenks@sugarsalem.com</u>	Telephone <u>208 356 0274</u>
Signature 		
Teacher or Lead Teacher (print) <u>Fred Woolley</u>	E-mail <u>fwoolley@sugarsalem.com</u>	Telephone <u>208 356 0274</u>
Signature 		

## **Teaching Teen Driving Safety through Innovative Simulation Training**

In Driver's Education, teen safety is the number one priority. But teaching teenage students how to be safe can be one of the toughest responsibilities for a Driver's Education Instructor. The Driver's Education teachers in the Sugar-Salem School District would like to purchase 3 software-based driving simulators to enhance the current program. This would allow us to increase teen driver safety, reduce operating costs yet maximizing "behind-the-wheel" time, and increase bus driver safety in our area.

There are shocking statistics regarding teens and driving safety. A study by the Virginia Tech Transportation Institute shows that texting while driving causes drivers to be 23 times more likely to crash or have a near-crash event. AAA says that up to 30% of teen drivers text or use their cell phones while driving. While it is not new to many about this unsafe practice of teen drivers, there are limited ways to teach the reality of life-changing consequences associated with unsafe distracted driving.

Another problem faced in Driver's Education is helping students who are fearful of driving for the first time. It is not unlikely or uncommon for students to "freeze" when confronted with driving hazards. These hazards can be as dangerous as debris on the highway or something as simple as the right-of-way at an intersection. Hearts race and palms sweat and students panic over relatively simple vehicle operations. Simulator practice and repetition allows students to overcome fear and face common hazard situations that could be life threatening before they ever get behind the wheel of an actual vehicle.

Now, imagine being able to have a teenage student drive through the city streets at night, cell phone in hand, and make objective observations and provide positive criticism, without the risk of destroying property or human life. Imagine helping a timid student overcome some of their fear of driving without the possibility of crashing the driver's education car or hurting other students. This is the scope of our project: to provide students with an innovative way to teach driver safety and allow for students to practice driving maneuvers without the cost of life. These simulators would give us objective feedback about a driver's speed throughout the drive and any safety rules which were broken. This would allow us to provide a student-specific feedback.

The Idaho Department of Education Driver Education department recently sent a newsletter to all driver's education teachers detailing a study by the University of Massachusetts which stated that "students who trained on simulators were 61 percent more likely to anticipate and glance at high-risk areas down the road during real driving scenarios." The state currently only has one (1) driving simulator. This simulator travels around the state and offers only a handful of students very limited driving time. With the support of our Department of Education backing our idea, we would offer these simulator services to our school district and invite surrounding districts to schedule time on them as well. This would potentially allow students from all over south-east Idaho to practice driving without risky consequences.

In addition to teen driving safety, the simulators allow for users to practice driving a bus. This would allow for our district's transportation department to provide supplemental training to their drivers, enabling more safety to all our bus-driven students.

We could also use the simulators to train some of our special education student population who, with time and much practice, could receive their driver's license. This would be a great tool for us to determine driver readiness in our special education students.

## **Current Technology Innovation in Use**

The Sugar-Salem Driver Education curriculum currently uses some technology-based methods of teaching driver safety. One method we use is something we call “video driving.” We mount a digital video camera in one of our own vehicles and drive around town making lane changes, turns, and different parking scenarios. We take this video and project it on the large screen in the classroom and allow the students to “drive” along with the video. Students pretend they are controlling the vehicle and “steer” a cardboard circle, copying the steering of the car in the video. We prompt them when they need to make a lane change and other actions and the students mime the action of applying the turn signal, turning on the wipers, etc. We have found that this approach, although slightly beneficial, does not have the same effect of the student driver actually controlling the vehicle on the screen.

We have noticed that when our students practice “video driving,” they retain some of the muscle memory of certain actions needed to safely drive a vehicle. They can remember how to adjust the lights, turn on the rear defrost, signal a lane change, or set the cruise control without having to take their eyes off the road. This on-screen practice gives the students perspective on what they might see or come across while driving. Before we implemented “video driving” it was not uncommon for students to drift into another lane when trying to set the cruise control or manipulate the buttons on the dashboard or center console. Student’s in-car driving scores increased by an average of 1.5 points (out of 10) after we started “video driving.”

We also use PowerPoint in our classroom presentations. We noticed early-on that students did not pay much attention when we lectured about driver safety, but were more alert and attentive when we projected a slideshow onto the screen. We use these slideshows to show safety videos, animations, and other audio-visual aids that help students learn. We can teach an idea through a 60-second video that would otherwise take us thirty minutes to accomplish through a lecture. We cover more material per class session and this material is more memorable to our students. Our quiz scores on PowerPoint lectures showed a 15% average gain over verbal only lectures. In our current lesson plans, we show at least one PowerPoint presentation in each day of class.

## Proposed Use of New Technology in the Classroom

As stated in our abstract, we would like to introduce our students to 3 software-based driving simulators in order to increase teen driving safety in our area. Our team members include: Sean Edwards, English and Driver Education teacher and Fred Woolley, School Counselor and Driver Education teacher. These two school employees are the foundation of the Driver Education program and will oversee purchasing, construction, maintenance, and repair of the simulators. Our team also includes Matt Grover, District Transportation Supervisor and Jerry Powell, Special Education Director. These two will help coordinate with Sean and Fred for the district's bus drivers and special education students to receive training on the driving simulators to increase their safety while driving.

In a typical driving hardware-based driving simulator, users sit in a simulated car and view 3 large projection screens. The hardware and software package for a system like this costs a minimum of \$25,000 per simulator. We have found a software company which makes a very detailed simulator that can run on a PC computer for only \$800. The price is what makes this project feasible. We can have three driving complete driving simulators for much less than the usual cost. The Simuride Driving Simulator Software allows students to drive at night, during a snow storm, on an icy road, in a busy city, and many other scenarios. The software was made specifically for driving schools and individuals who wanted to practice their driving skills "off the road."

We would include simulator time for each student enrolled in driver's education course and extra time for students who are apprehensive about driving on the roadway. We would also use this technology to teach about the dangers of distracted driving. We can have students text each other, apply their makeup, eat or drink while trying to navigate a busy city, or dangerously speed on a virtual highway in order to teach safety concepts.

This project is easily sustainable. Any software updates are easily downloadable and the PC parts are easily replaceable in the event they malfunction. The static pieces of the simulator (seat and desk) are well made, sturdy and can easily be replaced in the event they wear out after many years of use.

Because our district has two driver's education teachers, passing the knowledge required to run the simulators is much easier, as chances are only one teacher would ever be replaced at a time. This allows us to always have this technology accessible to our students and students from other school districts.

The Sugar-Salem School District Administration is in full support of the simulator project. Our Superintendent, Alan Dunn Driving Simulator said via an email regarding our idea, "It would be great if our district could be the first school district in Idaho to have full-time driving simulators. Great job and good luck!"

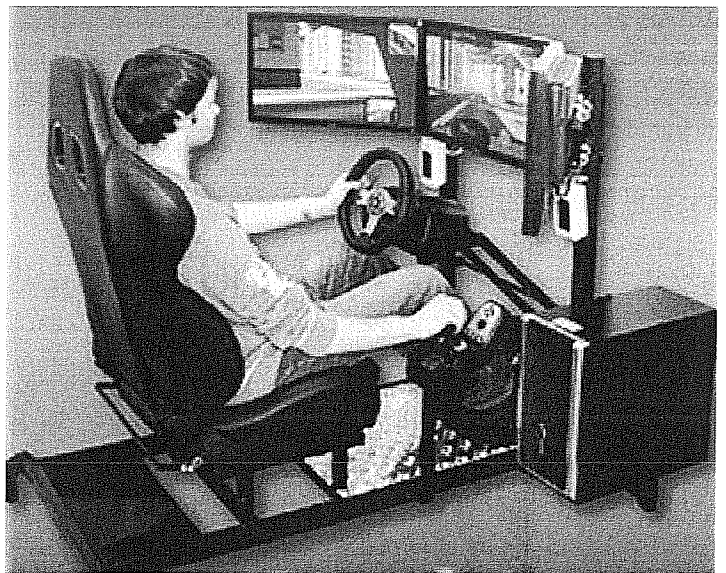


Figure 1 – One possible setup of the Simuride Driving Simulator

Similarly, our building Principal, Jared Jenks has said, “You two (Sean and Fred) are really going to make things better in this district. I know I made the right decision to hire you both for the driver’s ed positions.”

Due to this support, we are very confident we can provide an excellent training program for our district and neighboring communities.

We will initially determine the peak number of hours required in the simulator to produce the best in-car driving scores. We will track outcomes of the Simulator project by tracking test scores for in-car evaluations from 3 different test groups:

Control Group – students without simulator training (all past driver’s education classes)

1.5-hours Simulator Group - students with three half-hour simulator drives

3 hour Simulator Group – students with six half-hour simulator drives.

We already have data of in-car drive scores for the Control group, as any student previous to the Simulator project has had no simulator training. Our first cohort of students will be split into the two remaining groups. By the end of the first cohort, we hypothesize that the 3 hour Simulator Group will test better than the 1.5 hour Simulator Group. If it is determined that there is no significant difference in an increase of scores between these two groups, we may change the curriculum for each student to receive 1.5 hours in the Simulator. This would also allow for twice the number of students outside of our district to schedule time on the simulator.

We hope that you will see the merit of the project as it relates to the safety of our students this year, and many years to come.

## **Project Scope and Sequence**

The Simulator project will follow this timeline:

- January – receive funds from the state.
- By Jan 31 – Order all simulator parts from Amazon.com, Walmart.com, CDW.com and A+BSoftware.com
- Feb 15 – All parts have arrived and are assembled.
- Feb 16-20 – Train Driver's Ed instructors on Simulator use via instruction manual and 10 hours of phone help from A+B Software.
- Feb 22 – Begin simulator use with Driver's Education students, Special Education students, and district bus drivers.
- March-May – Evaluate project by tracking in-car evaluation scores
- June – Create and send video of our class using the technology to the State Department of Education
- August – Present the Simulator Project to other local Driver Education Teachers and to Sugar-Salem School District at our start of the year in-service.
- Mid-August – Submit online report to Idaho State Department of Education detailing expenditure of funds, implementation of the project, and an accounting of our presentation.

In our evaluation of the project, we will graph every student's scores from the 1.5 Hour Group and 3 Hour Group and see how early the scores reach the 9-10 level (on a scale from 1-10.) A score of 9 or 10 is a very good passing score for an in-car evaluation. We believe that the using the simulators, all of the students in both groups will reach scores of 9 or 10 up to 4 weeks earlier than our Control Group of students from previous years.

To evaluate the use of the project by our district bus drivers, we will coordinate with Math Grover, the District Transportation Supervisor and ask him to relay objective information regarding collision accidents (minor and major) regarding bus employees who have trained on the simulator versus drivers with no simulator experience. The project will be considered a success if it is found that there is a significant reduction in accidents or damage to the busses with drivers trained on the simulators.

To evaluate the use of the project with our Special Education population, we will compare records of previous Special Education students and when they attended a driver's education course and received their driver's license with the time it takes future Special Education students with hours of simulator experience prior to taking driver's education classes. The project will be considered a success if we can reduce the time a student can qualify for a license.

### **Explanation of Technology Purchases**

In order for this project to be a success we need to purchase the technology to make it capable of success.

The Simuride 3-Monitor Driving Simulator software allows the computer to display the driving simulations onto three computer monitors as though it were one screen or a windshield of a vehicle. This software is the core of our project and the cost is \$800 per unit or \$2400 total.

The Matrox Triplehead2go monitor splitting hardware is what connects to the single monitor output from the computer and splits it into three images allowing us to display the simulation stretched on three monitors. Without this hardware, the simulators would not work properly. The cost per device is \$300 with \$16 shipping with a total cost of \$916.

Logitech makes the G25 steering wheel, gear shifter, and pedals set. This allows each simulator to have a responsive wheel that returns to a centered position by itself and gives resistance and response when the vehicle turns or hits an object. The gear shifter allows us to train on a simulated manual transmission and the pedal set includes an accelerator pedal, brake pedal, and clutch pedal. This computer hardware allows us to control the vehicle on the screen and is vital for the realism of the simulation. The cost per set is \$240 with a total cost of \$720.

We need nine Acer 22" monitors for the three simulators. This gives us a greater field of vision and simulates the entire windshield of a vehicle. Cost per item is \$168 with a total cost of \$1512.

The Playseat Driving chairs are like the one pictured in Figure 1. These chairs are needed to increase the realism of the simulation experience. The Playseat Gearshift Mounts allow us to mount the gearshift in a realistic place for the driver (as opposed to placing it on the desk by the screens. The chairs cost \$300 each with a total cost of \$900 and the gearshift mounts cost \$40 per item with a total cost of \$120.

The 3-piece silver glass computer desks are where we place the computer monitors for each simulator. They also allow us to store the computer under the desk to conserve space. Each desk is \$89 with a total cost of \$267.

Finally, we need a computer to run the software. Each computer must have a 2 Ghz Intel processor, 1 gigabyte of RAM, and 128 MB of Video memory to meet the minimum requirements for the software. The computers we found meet these requirements and will not need to be upgraded in the future. Each computer costs \$900 with a total cost of \$2700. The Logitech LS21 Multimedia Speaker System creates the sound for the simulators. The cost per set is \$29.88 with a total cost of \$89.64.

Shipping costs have been reduced by sending items purchased at Walmart through their free Site-to-Store option and will be delivered free to Rexburg. Costs for the software shipping are only \$35. Cost for the rest of the items is only \$66 because some of the items qualify for free shipping.

This brings the total cost for the entire project to \$9709.64. An equivalent setup at a university research laboratory could cost up to \$75,000. We believe that our students can have the same experience with the software-based setup our project proposes.

<b>Budget for Teaching Teen Driving Safety through Innovative Simulation Training</b>					
<b>Capital Objects</b>	<b>Quantity</b>	<b>Price per Unit</b>	<b>Shipping cost</b>	<b>Subtotals</b>	
Simuride 3-monitor Driving Simulator software	3	800	35	2435	
Matrox Triplehead2go monitor splitting hardware	3	300	16	916	
Logitech G25 steering wheel, gear shifter, and pedals set	3	240		720	
acer 22" computer monitors	9	168		1512	
Playseat Driving chairs	3	300		900	
Playseats Gearshift Mount	3	40		120	
3-piece Glass computer desk, silver	3	89		267	
Toshiba PC with Intel Pentium Dual-Core T4200	3	900		2700	
Logitech LS21 Multimedia Speaker System for PCs	3	29.88		89.64	
Shipping cost for Amazon.com			50	50	
			<b>Grand Total:</b>	<b>9709.64</b>	

Fred Woolley Suger Salem High School